

REMARKS

The Office Action has been carefully considered, and applicant still believes that he has made significant and patentable improvements to the art of stream shapers.

Claims 1-47 remain in the application.

Claims 20 and 37 have been amended to correct typographical errors.

Original claims 1-37 were rejected under 35 U.S.C. 103(a) on U.S. Patent No. 2,054,964 to Barker taken with U.S. Patent No. 2,627,437 to Wornall.

Barker discloses a stream shaping arrangement that uses a pair of stream shapers that have completely different configurations. The first stream shaper is formed by three spaced-apart parallel plates 20 intersected by a perpendicular diametral plate 21. The other stream shaper also has three spaced-apart parallel plates 32 intersected by a perpendicular diametral plate 34, and a central tube member 30 divides the diametral plate 34 and the center one of the three parallel plates 32.

The two different stream shapers in Barker also have different sizes. It is plain from FIG. 1 of Barker that the stream shaper within throat 8 has a larger diameter than the stream shaper in throat 40. Furthermore, lines 9-20 of the left column on page 2 disclose the passageway 15 as being tapered.

While there is no specific mention that the two different stream shapers in Barker have different axial lengths, it is plain that they are of different lengths as shown in FIG. 1.

The Examiner misconstrues the disclosure in lines 45-50 in the right-hand column on page 1 of Barker as suggesting that the two stream shapers could be circumferentially offset relative to one another. Those lines of Barker read as follows:

"In the form of the invention shown, the plates 20 and 21 are associated with a sleeve 24 which is disposed in the throat 8 and said plates may be secured to this sleeve 24 in any desired and well known manner."

Barker simply is suggesting that the plates 20 and 21 could be secured to the sleeve 24 in any desirable manner such as welding, soldering or in some other manner. There is no disclosure whatsoever anywhere in Barker that would suggest to a person of ordinary skill in the art that the two stream shapers should be circumferentially displaced relative to one another. In fact, that appears to be counterintuitive because it would seem that the individual streams formed by the first stream shaper should be maintained and further straightened by the second stream shaper. It is not intuitive to believe that further dividing the individual streams formed by the first stream shaper would result in improved performance. The fact is that Barker shows the plates in the two stream shapers aligned with one another and their configurations are such that there would be no point in circumferentially offsetting them.

Wornall discloses a single stream shaper having a configuration that is generally similar to a single one of the stream shapers in the present application. The Examiner contends that the central cylindrical passage in Wornall is within 20% of the area of each vane passage, but that is not apparent from either the drawing or the disclosure of Wornall. The diameter of the cylindrical passage in Wornall is significantly larger than both the radial and circumferential dimensions of a vane passage.

The diameter of the circle on which the outer ends of the Wornall vanes are located is approximately 0.625 inch. Thus, the area of the entire cylindrical passage is approximately 1.9625 square inches. The diameter of the central cylindrical passage is approximately 0.225 inch and has an area of approximately 0.7065 square inches. Subtracting the area of the central

cylindrical passage from the entire passage area (1.9625 minus 0.7065) leaves 1.256 square inches for the total area of all the vane passages including the vane thickness. There are eight vane passages which means that each vane passage is smaller than 0.15 square inches (1.256 square inches divided by 8) and the central cylindrical area of 0.7065 square inches is nowhere near being within 20% of the area of a single vane passage.

The Examiner contends that it would be obvious to replace each of the different stream shapers in Barker with the Wornall stream shaper. It is plain that this suggestion comes only from the disclosure of the present application and not from any disclosure or suggestion in the references themselves. Barker teaches the use of two stream shapers that have completely different configurations and sizes. The references do not suggest any motivation to a person of ordinary skill in the art to replace the two different configurations and sizes with a common configuration and size. Furthermore, the references do not disclose, suggest or provide any motivation to a person of ordinary skill in the art for circumferentially offsetting one stream shaper relative to the other.

Another advantageous feature of the present application is the one-piece configuration of the pair of axially-spaced vane groups. Therefore, simply installing the single discharge pipe automatically ensures that the two vane groups are properly oriented.

As disclosed in the present application, it was surprisingly found that a much shorter stream shaper could provide performance equal to or better than a much longer stream shaper by configuring the stream shaper as two relatively short vane groups that are positioned very close together. The Examiner contends that the claimed vane group spacing of 0.150-0.350 inches is within the proportions shown by Barker. This simply is not so because Barker shows a huge

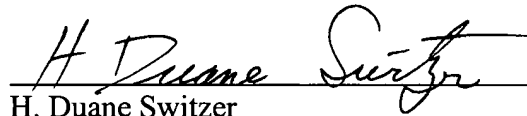
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Reply to Office Action of March 25, 2005

spacing between the two vane groups. Even in the reduced size of the drawing shown in Barker, there is a spacing of 0.750 inches between the two vane groups. If the nozzle is sized up to that of an actual firehose, the spacing would be significantly larger.

The stream shaper of the present application also includes a central cylindrical passage that extends continuously through both vane groups as well as through the space between the vane groups. Such an arrangement is not suggested by the references and would not be present even if the Wornall stream shaper is substituted for the Barker stream shapers.

In the absence of more pertinent art, this application is now in condition for allowance and an early notice to that effect is earnestly solicited.

Respectfully submitted,

A handwritten signature in cursive script, reading "H. Duane Switzer", is written over a horizontal line.

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